

A NEW SPECIES OF *ERIGERON*  
(ASTERACEAE: ASTEREA) FROM COLORADO

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ABSTRACT

*Erigeron wilkenii* (section *Spathifolium*), a new species from Dinosaur National Monument in western Colorado, is morphologically similar, and probably related, to *E. tener* A. Gray and *E. cronquistii* Maguire. In regional floras the species might also key to the somewhat similar *E. nematophyllus* or to the distantly related *E. kachinensis* and *E. eatonii*.

Several state records for Colorado (O'Kane, Neely, and Wilken 1988) and the following new species were discovered in 1987 during the first phase of a botanical inventory of Dinosaur National Monument by the Colorado Natural Areas Program (Galatowitsch et al. 1988, unpubl. report, Natl. Park Service, Denver Federal Center).

***Erigeron wilkenii* O'Kane, sp. nov.** (Fig. 1)—TYPE: USA, Colorado, Moffat County: Dinosaur National Monument, near mouth of Pool Canyon in alluvium of the Weber Formation in a *Pinus-Juniperus* community, T6N R104W sect. 12 SE $\frac{1}{4}$ , 1713 meters, 1 Jun 1987, S. L. O'Kane, Jr. 3014 (holotype, COLO; isotypes, BRY, RM, NY).

Differt haec species a *E. tener* ligulis albis ventraliter et phyllariis marginibus manifeste scariosis praeditis. Differt haec species a *E. cronquistii* apicibus foliorum mucrone 0.2–0.3 mm longo, nervis et basibus foliorum prominentibus et phyllariis apice non herbaceis.

Delicate erect perennial herb 10–20 cm tall; arising from a short, thin, simple or sparingly branched caudex with crowded internodes; caudex branches sparsely clothed in short, marcescent leaf bases of previous seasons; the root system fine, sparingly branched, mostly approximating a tap root. Stems 1(–4), 0.4–0.5 mm thick, sparsely strigose with mostly appressed and a few ascending Type A (Nesom 1978) trichomes 0.4–0.6 mm long. Leaves entire, basal and cauline; basal leaves tufted in a small rosette, spatulate, 9–62 mm long and 1.1–4.4 mm wide, most tapering in the distal half to a distinct petiole, although a few tapering to near base, sparsely strigose with appressed Type A trichomes up to 0.4 mm long, apex rounded to obtuse, mucronulate, petioles with hairs scattered throughout, not ciliate,

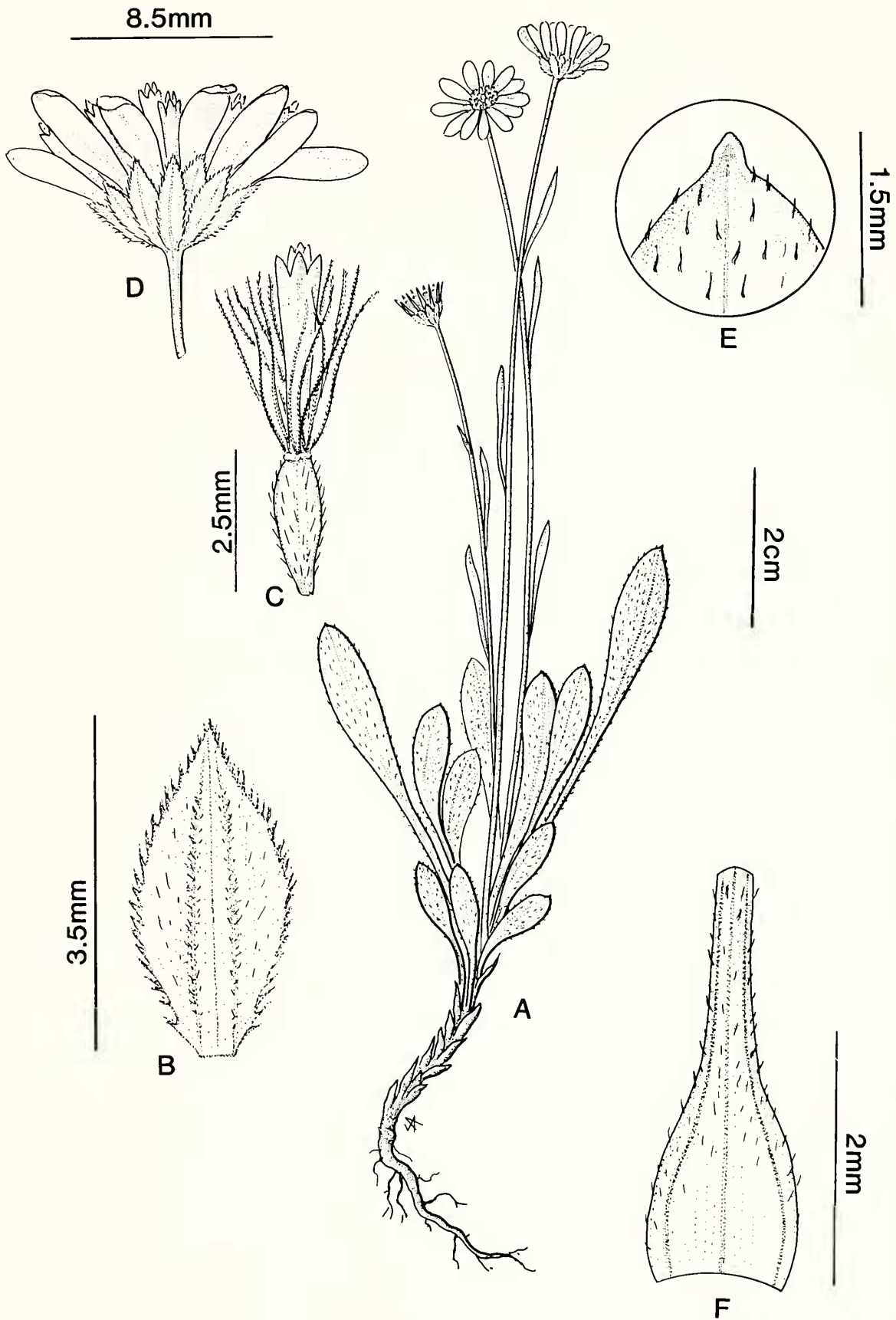


FIG. 1. *Erigeron wilkenii* (drawn from the holotype). A. Habit. B. Inner phyllary, showing wide scarious margins. C. Disc floret. D. Capitulum. E. Mucronulate leaf apex. F. Basal leaf base.

petiole bases enlarged, purplish, membranous, somewhat sheathing and with 3 distinct, slightly raised nerves, not distinctly ciliate but some small hairs like those above sometimes present on margins at very base; cauline leaves linear or linear-oblongate, to 21 mm long and 0.9 mm wide, gradually decreasing in size distally, somewhat more pubescent than basal leaves with similar trichomes and  $\pm$ ciliate, nerves of both basal and cauline leaves indistinct but mid-vein usually evident. Capitula solitary at stem apices, involucre 3.4–4.6 mm high and 6–8.5 mm wide when pressed. Phyllaries 13–20, imbricate in 2–3 series; the inner oblongate, ca. 3.5 mm long and 0.5–1.2 mm wide, scarious except for the narrow central green portion and prominent mid-rib, erose-fimbriate in upper half, apex acute and scarious; the outer lanceolate, somewhat shorter and narrower with less pronounced scarious margins; herbaceous portions of all phyllaries with scattered, short,  $\pm$ crinkly, mostly multicellular Type A hairs and fine, nearly sessile “glandular” Type B trichomes; hairs at base of outer phyllaries more abundant and somewhat longer than those above. Ray flowers (8–)11–12, corollas glabrous, white adaxially, light pink abaxially, 4.4–6.2 mm long, the tube 1.1–1.3 mm long, the lamina 3.2–5.1 mm long and 0.5–1.6 mm wide, lanceolate to oblongate, flat, the apices usually appearing long-acute or acuminate as the distal edges inroll with age or upon drying; disc flowers ca. 15–25, corollas glabrous, yellow, 2.2–3.5 mm long, lobes 0.4–0.6 mm long; style branches 0.6–0.7 mm long including the acute, linear-lanceolate to narrowly deltoid appendages. Pappus of ray and disc flowers shorter than the corollas, 1.5–2.4 mm long, tawny, of (12–)20–30 (averaging 23), fragile, barbellate capillary bristles; shorter setae or squamellae absent, but fractured bristles of dry material may appear as such. Mature achenes not seen, but immature disc and ray achenes essentially alike, 2-nerved, very short pubescent.

*Distribution and habitat.* The only known population of *Erigeron wilkenii* occurs on the sloping, west-facing base of the sheer walls of Pool Canyon above Echo Park. Soils are derived from sandstone of the Weber Formation and are composed of sandy alluvium deposited by intermittent Pool Creek and colluvium from the cliffs above. The site is partially shaded by short-statured trees of *Pinus edulis* Engelm. and *Juniperus osteosperma* (Torrey) Little. *Erigeron wilkenii* grows in accumulated duff and often in mats of *Selaginella densa* Rydb. *Poa fendleriana* (Steudel) Vasey is a common associate. *Pseudotsuga menziesii* (Mirbel) Franco, infrequent in the xeric environment of Dinosaur National Monument, grows above in shaded cracks of the canyon walls. Continuous potential habitat extends the 2.5 km from the type locality into Utah, where *E. wilkenii* can be expected.

TABLE 1. A DIAGNOSTIC COMPARISON OF *ERIGERON WILKENII*, *E. TENER*, *E. CRONQUISTII*, AND *E. NEMATOPHYLLUS*.

Character	<i>E. wilkenii</i>	<i>E. tener</i>	<i>E. cronquistii</i>	<i>E. nematophyllus</i>
Ray flower color	White ventrally, pink dorsally	Blue or purple	White or pinkish	White or pink
Pappus	Very fragile, shorter than disc corollas	Not fragile, equaling disc corollas	Fragile, shorter than disc corollas	Not fragile, shorter than but sometimes subequal to disc corollas
Inner phyllaries	Not or barely herbaceous to scarious tip; margins wide, prominently scarious, erose-fimbriulate; not purple-tipped	Herbaceous to tip or nearly so; margins narrow, scarious, sometimes erose-fimbriulate; often purple-tipped	Herbaceous to tip at least toward the midrib; margins prominently scarious, erosulate; purple at tip or throughout	Herbaceous to tip; margins narrow, scarious; often purple-tipped and usu. $\pm$ ciliate at least at the tip
Basal leaves	9-62 mm long, spatulate	13-75 mm long, oblanceolate, elliptic, rhombic or obovate	10-44 mm long, oblanceolate to elliptic	20-80 mm long, linear or narrowly linear-oblanceolate, rarely narrowly oblanceolate
Basal leaf apices	Rounded to obtuse, mucronulate	Acute, some with tip slightly indurated, not or seldom barely mucronulate	Rounded to obtuse, not or rarely barely mucronulate	Acute, some with tip slightly indurated but not mucronulate
Petioles	Not distinctly ciliate; sparsely strigillose	Not or rarely ciliate at very base; strigose, often densely so	May or may not be ciliate; sparsely strigillose	Distinctly ciliate toward base; sparsely strigillose but usu. glabrous dorsally
Petiole bases	Distinctly 3-nerved	Nerves not or barely visible, never prominent	Nerves sometimes visible but never prominent	Distinctly 3-nerved, lateral 2 sometimes faint
Caudex	Not or little branched, fine, sparsely and shortly clothed with old leaf bases	Moderately branched, mod. stout, mod. clothed with old leaf bases	Not or more commonly moderately branched, mod. delicate, mod. to densely clothed with old leaf bases	Usu. much branched, relatively stout, densely clothed with old leaf bases
Habit	Stems one or few	Stems several to many, caespitose	Stems several, or rarely one, caespitose	Stems usu. many, caespitose
Distribution	Limited to near Echo Park, Moffat Co., CO	NE and EC CA; NW AZ; S ID; NV; SC OR; W UT; WC and SW WY; not known from CO	Limited to the Bear River Mountains, Cache Co., UT	NW, NC, and SC CO; NE UT; C and SC WY

*Relationships and morphology.* Morphologically this species is most closely related to *Erigeron tener* A. Gray and *E. cronquistii* Maguire, taxa thought to be near relatives (Cronquist 1947; Maguire 1944). Like other taxa of the recently described section *Spathifolium* (Nesom 1989), *E. wilkenii* is a small perennial with oblanceolate-spatulate leaves, a strigulose indument of white, short, stiff and sharp-pointed hairs, erect buds, and ligules that neither coil nor reflex. Cronquist's (1947) section *Erigeron* ("Euerigeron") is now subdivided into eight sections (Nesom 1989), including section *Spathifolium*. *Erigeron wilkenii*, like *E. cronquistii* and several other recently described taxa, is another example of a narrow endemic related to *E. tener* that exists outside of the range of that species (Table 1) (Cronquist 1947; Spellenberg and Knight 1989; Nesom 1978; Nesom and Roth 1981). These three taxa are closely allied morphologically but can be distinguished by the combinations of characteristics given in Table 1.

After studying recent collections of related and similar species, I conclude that Cronquist's circumscription of *E. nematophyllus* Rydb. (Cronquist 1947) should be amended to include material possessing basal leaves wide than "linear or linear-oblanceolate" clearly belonging to that species. This material (e.g., *Dorn 3870* [RM, NY], *Neese and Henderson 14198* [BRY, NY, RM], and *O'Kane 2946* [RM]) indicates a closer link, based on leaf characteristics, between Cronquist's "Group VIII", which contains *E. nematophyllus*, and "Group IX" which contains *E. tener* and *E. cronquistii*. In terms of Nesom's (1989) infrageneric classification, this indicates that section *Spathifolium* is related to section *Wyomingia*. In regional floras (e.g., Weber 1987; Welsh et al. 1987), *Erigeron wilkenii* might also key to, in addition to the above, the unrelated *E. kachinensis*, which differs in its much wider leaves, flexuose stems, caudex not clothed with marcescent leaf bases, and habitat of alcove seeps in sandstone canyons. In Dorn (1988), *E. wilkenii* keys with difficulty to *E. tener*, *E. nematophyllus*, or *E. eatonii*. The species is clearly different from *E. eatonii* A. Gray, most notably in its white or pinkish rather than blue ligulate flowers.

High pollen stainability suggests that *E. wilkenii* is neither a recent hybrid nor a racial variant of another species caused by agamospermy with accompanying pollen infertility. Mature anthers from several individuals at or just prior to dehiscence were squashed, stained with Alexander's Stain (Alexander 1969) for 3.5 hours, and then gently flamed. Pollen stainability was 98.9 percent (n = 2000; stainable = 1978; inviable = 22).

*Erigeron wilkenii* is named for Dieter H. Wilken, who has, for well over a decade, been an advocate of botanical exploration and rare species conservation in Colorado.

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## LITERATURE CITED

- ALEXANDER, M. P. 1969. Differential staining of aborted and nonaborted pollen. *Stain Technol.* 44:117-122.
- CRONQUIST, A. 1947. Revision of the North American species of *Erigeron*, north of Mexico. *Brittonia* 6:121-302.
- DORN, R. D. 1988. Vascular plants of Wyoming. Mountain West Publ., Cheyenne, WY.
- MAGUIRE, B. 1944. Great Basin plants—VIII. New species in *Carex* and *Erigeron*. *Brittonia* 5:199-202.
- NESOM, G. L. 1978. *Erigeron hessii* sp. nov. and *Erigeron kuschei* Eastwood (Compositae), two closely related narrow endemics from the southwestern United States. *Brittonia* 30:440-446.
- . 1989. Infrageneric taxonomy of New World *Erigeron* (Compositae: Asteraceae). *Phytologia* 67:67-93.
- and V. D. ROTH. 1981. *Erigeron scopulinus* (Compositae), an endemic from the southwestern United States. *J. Arizona-Nevada Acad. Sci.* 16:39-42.
- O'KANE, S. L., JR., E. E. NEELY, and D. H. WILKEN. 1988. Noteworthy collections: Colorado. *Madroño* 335:353-354.
- SPELLENBERG, R. and P. KNIGHT. 1989. A new species of *Erigeron* (Asteraceae: Astereae) from central New Mexico. *Madroño* 36:115-121.
- WEBER, W. A. 1987. Colorado flora: western slope. Colorado Associated University Press, Boulder.
- WELSH, S. L., N. D. ATWOOD, L. C. HIGGINS, and S. GOODRICH. 1987. A Utah flora. *Great Basin Naturalist Mem.* 9:1-894.

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